

WHAT IS CLAIMED IS:

1. A linear power amplifier (LPA) shelf for a mobile communication base station, wherein the LPA shelf controls a path of at least one sector signal according to LPA types determined by LPA installation and a number of frequency assignments (FAs), provides the at least one sector signal to corresponding LPAs via the controlled path, and amplifies the at least one sector signal to a predetermined level to output the at least one amplified sector signal.

2. A linear power amplifier (LPA) shelf for a mobile communication base station, the LPA shelf comprising:

a signal dividing means that sets paths of at least one sector signal received according to LPA types determined by LPA installation and the number of FAs, the signal dividing means including a first signal divider, a second signal divider and a third signal divider;

a first switch means connected to the signal dividing means, that switches a first sector signal provided via a first path of set paths to a corresponding LPA;

a phase adjusting means connected to the first and second signal dividers, that adjusts a phase of a second sector signal so as to correspond to the first sector signal, the second sector signal being provided via a second path of the set paths;

a first LPA type conversion means connected to the third signal divider and the first switch means, that converts the LPA type;

an LPA means connected to the first switch means, the phase adjusting means and the first LPA type conversion means, that amplifies at least one sector signal provided from the first switch means, the phase adjusting means and the first LPA type conversion means to a predetermined level;

a second switch means connected to the LPA means, that switches to operate together the first switch means;

a second LPA type conversion means connected to the LPA means, that switches to operate together the first LPA type conversion means; and

a signal combining means connected to the LPA means and the second LPA type conversion means, that combines the at least one sector signal amplified by the LPA means according to respective sectors.

3. The LPA shelf according to claim 2, wherein the LPA installation is recognized by open collector signals generated from the respective LPAs.

4. The LPA shelf according to claim 2, wherein the LPA type is any one selected from the group consisting of a 1:1 type, a redundancy type and a 2 way combiner type.

5. The LPA shelf according to claim 2, wherein the signal dividing means and the signal combining means connect the first path and disconnect the second path if the LPA type is of a 1:1 type or a redundancy type.

6. The LPA shelf according to claim 2, wherein the signal dividing means and the signal combining means connect the first path and the second path if the LPA type is a 2 way combiner type.

7. The LPA shelf according to claim 2, wherein the phase adjusting means delays the phase of the second sector signal transmitted to the second path by an amount of delayed phase caused when the first sector signal passes through the first and second switch means.

8. The LPA shelf according to claim 2, wherein, if the determined LPA type is a redundancy type, the LPA means comprises three LPAs and a redundancy LPA, the three LPAs corresponding to the respective sectors, the redundancy LPA being substituted for an abnormal LPA of the three LPAs.

9. The LPA shelf according to claim 2, wherein, if the determined LPA type is a 2 way combiner type, the LPA means comprises six LPAs having two LPAs corresponding to the sector signals inputted via two paths per each sector.

10. The LPA shelf according to claim 2, wherein the first LPA type conversion means is switched to either the signal dividing means or the first switch means according to the determined LPA type.

11. The LPA shelf according to claim 2, wherein the second LPA type conversion means is switched to either the signal combining means or the second switch means according to the determined LPA type.

12. A method for managing an LPA shelf for a mobile communication base station, the method comprising the steps of:

setting paths of at least one sector signal received according to LPA types determined by LPA installation and the number of FAs;

switching a first sector signal provided via a first path of the set paths to a corresponding LPA;

adjusting a phase of a second sector signal so as to correspond to the first sector signal, the second sector signal being provided via a second path of the set paths;

amplifying at least one sector signal provided via either the first path or the second path to a predetermined level;

switching the at least one amplified sector signal; and

combining the at least one amplified sector signal according to the sectors.

13. The method according to claim 12, further comprising the steps of:

determining a current LPA type according to the LPA installation; and

determining a to-be-changed LPA type based on the current LPA type and the number of the FAs.

14. The method according to claim 12, wherein, if the LPA type is a 1:1 type and a redundancy type, the path of the at least one sector signal is set to only the first path.

15. The method according to claim 12, wherein, if the LPA type is a 2 way combiner type, the path of the at least one sector signal is simultaneously set to the first and second paths.

16. A method for switching LPA type of a mobile communication base station, the method comprising the steps of:

determining a to-be-changed LPA type based on a current LPA type and the number of FAs according to open collector signals generated from each LPA; and
switching the LPA type according to the determined LPA type.

17. The method according to claim 16, further comprising the steps of:

if the current LPA type is a redundancy type and simultaneously 3 or more FAs are required so that the redundancy type is to be switched to a 2 way combiner type, simultaneously connecting first and second paths of a signal dividing means;

simultaneously connecting a second path of a first LPA type conversion means and a second path of a second LPA type conversion means, respectively; and

simultaneously connecting first and second paths of a signal combining means.

18. The method according to claim 17, further comprising the step of(f) if the redundancy type is switched to the 2 way combiner type, delaying a phase of a second sector signal transmitted to the second path by an amount of delayed phase caused when a first sector signal passes through first and second switch means.

19. The method according to claim 16, further comprising the steps of:

if the present LPA type is a 2 way combiner type and simultaneously 3 or less FAs are required so that the 2 way combiner type is to be switched to a redundancy type, connecting a first path of a signal dividing means and disconnecting a second path of a signal dividing means;

connecting a first path of a first LPA type conversion means and a first path of a second LPA type conversion means, respectively; and

connecting a first path of a signal combining means and disconnecting a second path of a signal combining means.

20. The method according to claim 16, further comprising the steps of:

if the current type is a redundancy type and simultaneously the open collector signals are not received from a redundancy LPA so that the redundancy type is switched to a 1:1 type, connecting a first path of a signal dividing means and disconnecting a second path of a signal dividing means;

connecting a second path of a first LPA type conversion means and a second path of a second LPA type conversion means, respectively; and

connecting a first path of a signal combining means and disconnecting a second path of a signal combining means.

21. The method according to claim 16, wherein the open collector signals are generated whenever each LPA is installed.